Before the

Federal Communications Commission

Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Section 90.239 of	)	RM-8013
the Commission's Rules to Adopt	)	
Permanent Regulations for	)	
Automatic Vehicle Monitoring	)	
Systems	)	

TO: The Commission

REPLY COMMENTS

TEXAS INSTRUMENTS INCORPORATED
MFS NETWORK TECHNOLOGIES, INC.

Andrew D. Lipman
Catherine Wang
Swidler & Berlin, Chartered
3000 K Street, N.W.
Suite 300
Washington, D.C. 20007

Steven P. Reynolds
Legal Counsel
Texas Instruments Incorporated
13510 North Central Expswy
P.O. Box 655474, MS 241
Dallas, Texas 75265

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SUMMARY

Texas Instruments, Incorporated and MFS Network Technologies ("TI/MFS") urge the Commission to reduce the two 8 MHz blocks set aside for wideband, pulse ranging systems to a single 8 MHz block, at a maximum. The Commission's allocation should permit valuable AVI technologies other than wideband pulse ranging systems, such as tag/reader modulated backscatter systems, to continue to develop and operate. An allocation of 8 MHz, at a maximum, to pulsing technologies and 18 MHz of contiguous spectrum, at a minimum, will allow tag/reader systems to operate cost-effectively and at optimal performance levels.

TI/MFS believes that simple, relatively inexpensive pulse separation techniques can and should be employed, if necessary, by wideband systems to co-exist with other wideband pulsing operators in a single 8 MHz block. Consistent with TI/MFS' opening comments, a number of parties share TI/MFS' view that the current proposal allocates an excessive amount of spectrum exclusively to pulsing systems. The proposal in the Notice does not adequately accommodate the multiple providers and projects currently using medium band, nonpulsing tag/reader systems and will inhibit innovation and competition in automatic vehicle identification and monitoring systems. TI/MFS' proposed modification fairly and rationally allocates spectrum among wideband, pulsing and all other AVI technologies and the public interest would be served if the proposed modification is adopted.

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Amendment of Section 90.239 of the Commission's Rules to Adopt Permanent Regulations for Automatic Vehicle Monitoring Systems	)	RM-8013

TO: The Commission

REPLY COMMENTS

Texas Instruments Incorporated ("TI")and MFS Network Technologies, Inc. ("MFS") (hereinafter collectively referred to as "TI/MFS") respectfully submit these joint reply comments in the above-captioned proceeding. In its initial comments in this proceeding, TI/MFS generally supported the adoption of permanent rules for automatic vehicle monitoring systems (hereinafter referred to as "AVI" systems). Permanent AVI rules will provide a level of certainty and stability that will encourage greater financial investment in and technical development of innovative, cost-efficient new AVI technologies.

As stated at length in its opening comments, however, TI/MFS fervently believes that in promulgating permanent AVI rules, the Commission must not sacrifice the numerous existing AVI projects underway or adopt rules that create serious and permanent impediments to the full development of useful, cost-efficient medium band, nonpulsing systems in the future. Specifically, TI/MFS opposes that aspect of the Commission's proposal that would set aside two 8 MHz blocks -- a majority of available AVI spectrum --

in the 902-928 MHz band for the exclusive use of wideband, pulse ranging AVI systems and to limit narrowerband systems to a much smaller area (of 10 MHz of noncontiguous spectrum). As explained in the initial comments, TI/MFS strongly believes that the allocation scheme proposed in the Notice of Proposed Rulemaking ("Notice") in this proceeding is overly and unnecessarily generous in favor of wideband, pulse ranging AVI technologies and, unfairly punishes those that offer other useful and innovative AVI technologies and the numerous state and private projects that are using or will use those systems.

Accordingly, TI/MFS urged the Commission to modify its proposal to encourage diversity in AVI technologies, including narrowerband tag systems (modulated backscatter systems), and healthy competition among AVI system operators. TI/MFS specifically recommended that the Commission reduce the proposed exclusive allocation of 8 MHz for pulsing systems from two 8 MHz blocks to one 8 MHz block. TI/MFS proposed a modified approach on the assumption that pulse ranging systems are sensitive to interference from narrowband systems, as stated by Pactel Teletrac. The TI/MFS proposal also is consistent with the Commission's conclusion and the view of a number of other parties that wideband pulse ranging system can "operate on a non-exclusive basis, albeit with cooperation among co-channel licensees serving the same area." Notice at para 21.

I. The Commission Should Ensure that Both Pulse Ranging as Well as Tag/Reader Backscatter AVI Systems Can Continue to Develop and Operate by Allocating No More than a Single 8 MHz Block to Pulsing Technologies and A Minimum of 18 MHz of Contiguous Bandwidth For Use by Other AVI Systems

In the opening comments, TI/MFS urged the Commission to modify the proposed allocation plan for the 902-928 MHz band to better accommodate the various current and planned nonpulsing, narrowerband AVI systems. In particular, TI/MFS proposed that only one 8 MHz block be devoted exclusively to wideband pulsing technologies and the

3. some flexibility in locating the center frequency of the 8 MHz block to avoid possible local interference that may be identified on-site upon final radiofrequency selection.

As stated in TI/MFS' initial comments, short-range tag/reader AVI systems may be able to operate using a contiguous block of 6 MHz. Such limited bandwidth, however, would significantly restrict capacity and quality and increase system costs. In short, the substantial benefits of high quality, sophisticated tag/reader AVI systems will be diminished to the extent that the Commission's final allocation plan departs from these three basic requirements. TI/MFS' recommended modification to the Commission's proposal introduced in the opening comments, if adopted, will satisfy these requirement by devoting only one 8 MHz block, at a maximum, for pulsing systems, and making the remaining 18 MHz of contiguous spectrum available to other AVI technologies.

The Commission should be aware of the real-world impact that its allocation decision in this proceeding will have on the many existing tag/reader systems and ongoing projects. If the Commission decides to adopt an allocation that does not meet the above three basic

tag/reader modulated backscatter systems to operate cost-effectively and at optimal performance levels.

II. Wideband Systems Can Share a Single 8 MHz Spectrum Block

TI/MFS continues to believe that the Commission's proposal should be modified to devote, at a maximum, only a single 8 MHz block to wideband, pulse ranging technologies. Pactel Teletrac, the principal proponent of wideband pulse ranging systems and the proposal to devote 16 MHz of the available 26 MHz to such systems, argues at great length in its comments that wideband pulsing systems cannot share frequencies with other wideband operators, contrary to the view of the Commission and numerous other parties. Teletrac's position, however, is inconsistent with the fact that numerous wideband pulse ranging systems presently co-exist in a common frequency band without significant difficulties. One example of such a system is aircraft distance measuring equipment ("DME") which operates in the L band between 1050 MHz and 1150 MHz. In a DME system, each ground station has an assigned frequency. Aircraft can measure their distances to the ground station by emitting a pulse. The ground station receives the pulse and, responds with a pulse, the

in a receiver and each time delay measured. Numerous manufacturers produce this relatively simple equipment for as little as $300 per unit.

Generally, pulse separation requires some degree of sophistication in signal processing based on the presumption that any reply which is detected synchronous to the transmitted pulse was caused by the transmitted pulse. TI/MFS believes that these techniques for pulse separation are well-known, simple to incorporate into wideband [redacted]

III. The Comments Demonstrate That an Allocation of Two 8 MHz Blocks For Exclusive Use of Wideband Pulsing Systems is Excessive

Numerous parties filing opening comments share TI/MFS view that two 8 MHz blocks should not be reserved for the exclusive use of wideband, pulse ranging systems. In particular, several parties express serious concern that the proposed reservation of 16 MHz to pulsing technologies will not adequately provide for existing and future needs.

CALTRANS argues that the Commission's allocation plan as proposed, discourages use of valuable, innovative short-range, two-way highway communication.[1/] CALTRANS describes just a few of the valuable applications it foresees for short-range AVI communications systems, including electronic toll collection, congestion pricing, "vehicle as probe" applications, fleet management, use as a traffic information resource, and vehicle navigation.[2/] With respect to the relative benefits of wideband pulsing systems and short-range tag/reader systems, CALTRANS states:

> Teltrac has described their system to us and we agree that they have an exciting and worthwhile service. We do not believe, however, that the benefits of the Teletrac service even approach the societal benefits of short range, two-way, roadway to vehicles communications as typified by the current electronic toll collection projects.[3/]

CALTRANS goes on to state that given adequate spectrum, short range roadway to vehicle communications will expand into many new areas of service, "[w]e cannot imagine a more

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1/ Comments of CALTRANS, at 5-6.

2/ Id. at 4-5.

3/ Id. at 3.

effective use of radio spectrum."[4/] On that basis, CALTRANS specifically proposes that

Communications and Amtech both propose that the Commission open the entire 26 MHz to all AVI systems. Amtech and AAR specifically propose that only 4 MHz of spectrum be allocated to pulse ranging systems.[10/]

IV. Substantial Support Exists for Modifying the Commission's Allocation Proposal to Better Accommodate Narrowerband, Non-Pulsing Technologies

A number of commenters agree that the Commission's proposal to devote 16 MHz out of the available 26 MHz of spectrum exclusively to pulse ranging systems unnecessarily inhibits the operation of other existing technologies. The International Bridge, Tunnel and Turnpike Association ("IBTTA"), Hughes and others believe that the current Commission proposal will inhibit the development of other AVI technologies and disrupt existing research and development. Many government agencies and private highway builders are interested in developing medium band modulated backscatter technologies. These entities

> which would diminish spectrum capacity and limit the multiplicity of users . . . The committee also supports the adoption of rules that, consistent with the policies and goals of the Intelligent Vehicle Highway Systems Act of 1991, would promote the development and implementation of intelligent vehicle highway systems by providing access to essential electronic spectrum and enable public entities to install IVHS as part of their transportation infrastructure. The Committee is concerned that the rules proposed in Docket No. 93-61 may inhibit such development and impede operational tests approved by this Committee. The Committee generally encourages rules that maximize flexibility for users selecting competing AVM systems.[11/]

TI/MFS' TIRIS™-based[12/] systems, for example, are an innovative, cost efficient tag/reader system that generally requires 6 MHz of contiguous spectrum. As explained in detail in the opening comments, the TI/MFS TIRIS™-based system is consistent with the technical and performance standards developed by CALTRANS. That standard establishes guidelines intended to promote compatibility and uniformity among the multiple electronic traffic and toll management ("ETTM") systems being implemented in California that are expected to deliver significant benefits to the motorists, cities, employers and taxpayers in California. Among other projects, TI/MFS plans to implement an ETTM system for California's State Route 91 (SR-91).

Under the proposed allocation, only a single band of 6 contiguous MHz would be suitable for use by the TIRIS™ systems and other medium band systems. The Commission's proposal unnecessarily compels medium band system users to locate their systems on the

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11/ Senate Rep. No. 103-105, Departments of Commerce, Justice and State, the Judiciary, and Related Agencies Appropriation Bill, 1994, 103rd Cong., 1st. Sess., Jul. 22, 1993.

12/ TIRIS™ is a trademark of Texas Instruments Incorporated.

only 6 MHz block available for such systems. This "rush to the middle" will inevitably cause congestion and could seriously inhibit the utility of nonpulsing medium band systems since the proposed allocation leaves little flexibility to shift frequencies in the case of conflict.

The current proposed allocation unfairly sets aside more bandwidth than is necessary for the effective development of wideband pulsing systems and leaves an insufficient bandwidth for the full development and operation of narrowerband systems. All medium band nonpulsing AVI technologies will be confined to a meager 6 MHz of bandwidth. That limited medium band allocation cannot adequately accommodate the multiple providers in this area and major medium band modulated backscatter projects ongoing and planned throughout the country. The proposed allocation will inhibit innovation and competition in AVI systems thus severely reducing the likelihood that the public will be able to fully realize the benefits of AVI systems.

TI/MFS' modified approach represents a far more equitable and rational allocation of this resource. Under the modified scheme, wideband pulsing system operators are granted a 8 MHz block free of interference from narrowerband systems; narrowerband systems will have the shared use of the rest of the available spectrum. TI/MFS strongly believes that this approach will permit the Commission to fairly accommodate both pulsing and narrowerband tag/reader systems and will serve the public interest in fostering the development of diverse technologies and competition among multiple providers.

CONCLUSION

For these reasons discussed herein, TEXAS INSTRUMENTS INCORPORATED and MFS NETWORK TECHNOLOGIES, INC. respectfully request that the Commission modify its proposal for permanent AVI rules by adopting, at a maximum, a single 8 MHz block allocation for pulsing, wideband systems permitting the remainder of the 902-928 MHz spectrum to be shared by non-pulsing AVI systems.

Respectfully submitted,

TEXAS INSTRUMENTS INCORPORATED
MFS NETWORK TECHNOLOGIES, INC.

Andrew D. Lipman
Catherine Wang
Swidler & Berlin, Chartered
3000 K Street, N.W.
Suite 300
Washington, D.C. 20007

Steven P. Reynolds
Legal Counsel
Texas Instruments Incorporated
13510 North Central Expswy
P.O. Box 655474, MS 241
Dallas, Texas 75265

Counsel for MFS Network Technologies, Inc.

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